



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,402	10/20/2003	Peng Zhang	06412 USA	2570

23543 7590 02/03/2006

AIR PRODUCTS AND CHEMICALS, INC.  
PATENT DEPARTMENT  
7201 HAMILTON BOULEVARD  
ALLENTOWN, PA 181951501

EXAMINER
----------

CARRILLO, BIBI SHARIDAN

ART UNIT	PAPER NUMBER
----------	--------------

1746

DATE MAILED: 02/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/689,402	Applicant(s) ZHANG ET AL	
	Examiner Sharidan Carrillo	Art Unit 1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-24 and 34-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-24 and 37 is/are allowed.
- 6) ☒ Claim(s) 34-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 34-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Kakizawa et al. (6310019).

Kakizawa teaches a method of cleaning a semiconductor substrate using a nonionic surfactant and a solvent (ammonia or a primary to tertiary amine, col. 10). Col. 15, Example 1 teaches a cleaning composition comprising a solvent and the nonionic surfactant. Col. 4, formula 3 teaches Formula 1 of claim 34. Col. 7, lines 20-230 teaches the surfactant having a range of 1-10,000 ppm. Col. 1, lines 20-45 teaches using the method to remove particles after a post CMP process. In reference to claims 35-36, refer to Example 2 in col. 16.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 34-36 are rejected under 35 U.S.C. 102(e) as being anticipated Hsu (US2004/0149309).

Hsu teaches a method of cleaning a semiconductor substrate using a nonionic surfactant (paragraph 18) and a solvent (nonammonium producing strong base and an amide solvent (paragraph 22)). The method can be used to clean residues after a CMP process. Paragraph 10 teaches low k dielectrics. Col. 4, claim 1 teaches 0-5% by weight of a surfactant. Paragraph 25 teaches rinsing with deionized water.

5. Claims 34-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (6641986).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Zhang et al. teach a method of contacting the substrate with a process solution comprising 10-10000 ppm of surfactant having formula I and II. In paragraph 30, the process solution further comprises a solvent. Paragraphs 29 and 42 teach using the solution for post-CMP processes. Paragraph 63 teaches DI water rinse.

Zhang et al. teach a method of treating the substrate with a process solution comprising 10-10000 ppm of surfactant of Formula I and II and a solvent (col. 5, lines 35-40). In reference to a post CMP processed substrate, col. 8, lines 10-12 teaches

treating a substrate having a low k dielectric material. Col. 7, lines 50-65 further teaches treating substrates having dielectric materials. The limitations of a post-CMP processed substrate are inherently met since Zhang et al. teach treating substrates having low-k dielectric materials, which are formed as a result of a CMP process. Col. 8, lines 55-60 teaches a rinse stream.

***Allowable Subject Matter***

6. Claims 1-24 and 37 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach the method of treating post-CMP substrate by contacting with a process solution having the claimed surfactant, as defined by the formulas of claims 1 and 37.

***Response to Arguments***

7. Applicant argues that Kakizawa teaches a quaternary ammonium compound and not a solution consisting of 3 components. Applicant is not claiming a solution consisting of 3 components. Applicant's arguments are not commensurate in scope with the instantly claimed invention. Applicant is claiming "consisting essentially of" instead of "consisting of". Applicant needs to show that the ammonium compound of Kakizawa does not materially affect the basic and novel characteristics of the instantly claimed invention.

8. Applicant argues that Hsu fails to teach the claimed invention. Specifically applicant argues that Hsu fails to teach each post CMP residue. Applicant is directed to paragraph 1 which teaches cleaning residues from CMP processes.

9. Applicant argues that Hsu teaches a non-HF producing salt compound and not a solution consisting of 3 components. Applicant is not claiming a solution consisting of 3 components. Applicant's arguments are not commensurate in scope with the instantly claimed invention. Applicant is claiming "consisting essentially of" instead of "consisting of". Applicant needs to show that the salt of Hsu does not materially affect the basic and novel characteristics of the instantly claimed invention.

10. The rejection of the claims as being anticipated by Zhang (6641986) is maintained since a 1.132 Declaration has not been provided. All other rejections, as anticipated by Zhang ('395, '172, '329, '800 Publications) are withdrawn in view of the 1.132 Declaration.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on M-W 6:30-4:00pm, alternating Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sharidan Carrillo  
Primary Examiner  
Art Unit 1746

bsc



SHARIDAN CARRILLO  
PRIMARY EXAMINER